



**Rules and Regulations
for the Construction and
Classification of Ships
for the Carriage of
Liquefied Gases in Bulk,
July 2008**

Notice No. 5

Effective Date of Latest
Amendments:

See page 1

Issue date: November 2009

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RULES AND REGULATIONS FOR THE CONSTRUCTION AND CLASSIFICATION OF SHIPS FOR THE CARRIAGE OF LIQUEFIED GASES IN BULK, *July 2008*

Notice No. 5

This Notice contains amendments within the following Sections of the *Rules and Regulations for the Construction of Ships for the Carriage of Liquefied Gases in Bulk, July 2008*. The amendments are effective on the dates shown:

Chapter	Section	Effective date
5	5	1 January 2010
6	2	Corrigenda
17	20	Corrigendum

The *Rules and Regulations for the Construction and Classification of Ships for the Carriage of Liquefied Gases in Bulk, July 2008* are to be read in conjunction with this Notice No. 5. The status of the Rules is now:

Rules for Ships for Liquefied Gases	Effective date:	July 2008
Notice No. 1	Effective dates:	1 July 2008
Notice No. 2	Effective dates:	1 August 2008, 1 November 2008 & Corrigenda
Notice No. 3	Effective dates:	1 January 2009 & Corrigendum
Notice No. 4	Effective dates:	1 April 2009 & Corrigenda
Notice No. 5	Effective date:	1 January 2010 & Corrigenda

All text which does not appear in the IGC Code is prefixed by 'LR' and thick vertical lines (see LR II.3)

Chapter 5

Process Pressure Vessels and Liquid, Vapour and Pressure Piping Systems

Effective date 1 January 2010

5.3 Type tests on piping components

5.3.2.1 Each size and type of valve intended to be used at a working temperature below -55°C should be subjected to a tightness test to the minimum design temperature or lower, and to a pressure not lower than the design pressure of the valve. During the test the satisfactory operation of the valve should be ascertained.

LR 5.3-01 To satisfy the requirements of 5.3.1 and 5.3.2.1, for valves fitted to cargo and process piping systems, each size and type of valve is to be approved through prototype testing and is to include a hydrostatic test of the valve body at a pressure equal to 1,5 times the design pressure, a seat and stem leakage test at a pressure equal to 1,1 times the design pressure and cryogenic testing consisting of valve operation and leakage verification. Prototype testing to the minimum design temperature or lower and to a pressure not lower than the maximum design pressure for the valves is to be completed to the satisfaction of the LR Surveyor.

LR 5.3-02 For valves intended to be used at a working temperature above -55°C prototype testing in accordance with LR 5.3-01 is not required.

LR 5.3-03 All valves are to be tested at the manufacturer's works to the satisfaction of the LR Surveyor. Testing is to include a hydrostatic test of the valve body at a pressure equal to 1,5 times the design pressure and a seat and stem leakage test at a pressure equal to 1,1 times the design pressure. In addition, cryogenic testing consisting of valve operation and leakage verification for a minimum of 10 per cent of each type and size of valve for valves intended to be used at a working temperature below -55°C .

Alternatively, the manufacturer may request LR to certify a valve subject to the following:

- (a) the valve has been prototype tested as required by LR 5.3-01 for valves intended to be used at a working temperature below -55°C ; and
- (b) the manufacturer has a recognised quality system that has been assessed and certified by LR in accordance with the requirements of Pt 5, Ch 1,6 of the Rules for Ships; and
- (c) a quality control plan is submitted which contains a provision to subject each valve to a hydrostatic test of the valve body at a pressure equal to 1,5 times the design pressure and seat and stem leakage test at a pressure equal to 1,1 times the design pressure; the manufacturer is to maintain records of such tests; and
- (d) cryogenic testing consisting of valve operation and leakage verification for a minimum of 10 per cent of each type and size of valve for valves intended to be used at a working temperature below -55°C to the satisfaction of the LR Surveyor.

5.3.2.2 The following type test should be performed on each type of expansion bellows intended for use on cargo piping outside the cargo tank and, where required, on those expansion bellows installed within the cargo tanks:

- .1 A type element of the bellows, not precompressed, should be pressure tested at not less than 5 times the design pressure without bursting. The duration of the test should not be less than 5 min.
- .2 A pressure test should be performed on a type expansion joint complete with all the accessories such as flanges, stays and articulations, at twice the design pressure at the extreme displacement conditions recommended by the manufacturer without permanent deformation. Depending on the materials used, the Administration may require the test to be at the minimum design temperature.
- .3 A cyclic test (thermal movements) should be performed on a complete expansion joint, which is to successfully withstand at least as many cycles, under the conditions of pressure, temperature, axial movement, rotational movement and transverse movement, as it will encounter in actual service. Testing at ambient temperature is permitted, when this is at least as severe as testing at the service temperature.
- .4 A cyclic fatigue test (ship deformation) should be performed on a complete expansion joint, without internal pressure, by simulating the bellows movement corresponding to a compensated pipe length, for at least 2,000,000 cycles at a frequency not higher than 5 cycles/s. This test is only required when, due to the piping arrangement, ship deformation loads are actually experienced.
- .5 The Administration may waive performance of the tests referred to in this paragraph provided that complete documentation is supplied to establish the suitability of the expansion joints to withstand the expected working conditions. When the maximum internal pressure exceeds 1,0 bar gauge this documentation is to include sufficient test data to justify the design method used, with particular reference to correlation between calculation and test results.

LR 5.3-04 Each size and type of cargo pump is to be approved through prototype testing and is to include a hydrostatic test of the pump body equal to 1,5 times the design pressure and a capacity test. For pumps intended to be used at a working temperature below -55°C , the capacity test is to be carried out at the minimum working temperature using the fluid for which the pump is intended. On completion of testing, the pump is to be opened out for examination. Prototype testing is to be completed to the satisfaction of the LR Surveyor.

LR 5.3-05 All cargo pumps are to be tested at the manufacturer's works to the satisfaction of the LR Surveyor. Testing is to include a hydrostatic test of the pump body equal to 1,5 times the design pressure and a capacity test. For pumps intended to be used at a working temperature below –55°C, the capacity test is to be carried out at the minimum working temperature.

Alternatively the manufacturer may request LR to certify a pump subject to the following:

- (a) the pump has been prototype tested in accordance with the requirements in LR 5.3-04; and
- (b) the manufacturer has a recognised quality system that has been assessed and certified by LR in accordance with the requirements of Pt 5, Ch 1,6 of the Rules for Ships; and
- (c) a quality control plan is submitted which contains a provision to subject each pump to a hydrostatic test of the pump body equal to 1,5 times the design pressure and a capacity test. The manufacturer is to maintain records of such tests.

Chapter 6

Materials of Construction

CORRIGENDA

6.2 Material requirements

TABLE 6.4 (Part only shown)

PIPES (SEAMLESS AND WELDED) ¹ , FORGINGS ² AND CASTINGS ² FOR CARGO AND PROCESS PIPING FOR DESIGN TEMPERATURES BELOW 0°C AND DOWN TO –165°C ³			
Maximum thickness 25 mm			
Minimum design temp. (°C)	Chemical composition ⁵ and heat treatment	Impact test	
		Test temp. (°C)	Minimum average energy (E) (J)
–55	Carbon-manganese steel. Fully killed fine grain. Normalized or as agreed ⁶	4 (See Note 4)	27
–65	2,25% nickel steel. Normalized or normalized and tempered ⁶	–70	34
–90	3,5% nickel steel. Normalized or normalized and tempered ⁶	–95	34
–165	9% nickel steel ⁷ . Double normalized and tempered or quenched and tempered	–196	41
	Austenitic steels, such as types 304, 304L, 316, 316L, 321 and 347. Solution treated ⁸	–196	41
	Aluminium alloys; such as type 5083 annealed		Not required
TENSILE AND TOUGHNESS (IMPACT) TEST REQUIREMENTS			
Each batch to be tested			
IMPACT TEST – Longitudinal test pieces			

Chapters 6 & 17

Hull Structure

LR 6.2-03 The Grade E strakes are to be extended over 0,4L amidships. The breadth of each strake is to be not less than 1500 mm, but ~~Note 2~~ **Note 10** of Table 2.2.1, in Pt 3, Ch 2 of the Rules for Ships is to be complied with.

Chapter 17

Special Requirements

CORRIGENDUM

17.20 **Propylene oxide and mixtures of ethylene oxide-propylene oxide with ethylene oxide content of not more than 30% by weight**

17.20.3.1 All valves, flanges, fittings and accessory equipment should be of a type suitable for use with these products and should be constructed of steel or stainless steel in accordance with recognized standards. Discs or disc faces, seats and other wearing parts of valves should be made of stainless steel containing not less than 11% chromium.

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